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FEASIBILITY STUDY

US 401, From US 1 to SR 2224
Wake County
R-2425

Prepared by
Planning and Research Branch
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6/27/89
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I. DESCRIPTION

This report covers a preliminary study of the proposed widening of the subject road to a multi-lane facility for a distance of approximately 4.5 miles. This project is included in the 1988-1996 Transportation Improvement Program (TIP) for feasibility study and/or right-of-way protection. It is not currently funded. Location of project is shown on Figure 1.

II. PURPOSE OF PROJECT

Existing Route Characteristics

The subject route appears on the Greater Raleigh Urban Area Thoroughfare Plan (adopted 1986) as a major thoroughfare.

The studied section of US 401 has a basic 2-lane pavement width of 20 feet with 4-foot shoulders from New Hope Road (SR 2108) to Mitchell Mill Road (SR 2224) north of the Neuse River. The section from the US 1 interchange to New Hope Road (SR 2108) has a 3-lane, 48-foot paved section with curbing on the west side. The curbing was installed 32-feet west of the road centerline assuming a future 64-foot, 5-lane curb and gutter roadway. There are right and left turn lanes added at Kyle Drive (SR 2213).

North of the northern project limit at SR 2224, US 401 continues with a 2-lane, 20-foot pavement.

Traffic signals exist presently at Mitchell Mill Road (SR 2224), New Hope Road (SR 2036 east of US 401) and New Hope Road (SR 2108 west of US 401). Speed limits on the studied route are as follows:

45 mph - US 1 to Dansey Drive; Rufus J. Ivey House (historic home described below, see Figure 1) to Perry Creek Road (SR 2006).

55 mph - Dansey Drive to Rufus J. Ivey House; Perry Creek Road (SR 2006) to Mitchell Mill Road (SR 2224).

All intersections are at-grade with the exception of the US 1/401 flyover interchange at the south end of the project. The existing flyover carrying US 1 northbound bridge over US 401 has a minimum horizontal clearance of 57 feet underneath the bridge, which will only permit four, 12-foot travel lanes with curb and gutter on US 401.

There is one bridge on the route and its characteristics are as follows:

<u>Bridge No.</u>	<u>Location</u>	<u>Date Built</u>	<u>Length</u>	<u>Width</u>	<u>Sufficiency Rating</u>
131	Neuse River	1938	349'	25.8'	63.5

Existing roadside development is mainly residential with light commercial property interspersed throughout. Two historic properties are located along the route: Apheus (Seth) Jones House (on the National Register of Historic Places); and the Rufus F. Ivey House (eligible for inclusion on the National Register of Historic Places). See Figure 1 for approximate location of these structures.

The Northern Wake Expressway/Outer Loop appears on the thoroughfare plan mentioned above and is proposed to cross the subject route between the two historic properties above. An interchange is proposed at this location and is to be provided with the construction of the Northern Wake Expressway.

Traffic Volumes, Capacity, and Accident History

Current traffic volumes on US 401 range from a high of approximately 22,000 vehicles per day (vpd) at the New Hope Road dogleg intersection to a low of 10,800 vpd near Fox Road (SR 2042), with 13,500 vpd at the Neuse River. Beyond SR 2224, the traffic volume drops to approximately 8,000 vpd. Estimated traffic volumes for 2010 are estimated at 50,000 vpd south of the Northern Wake Expressway and 35,000 vpd north of the Expressway.

At a desirable level of service C in the urban environment predominant along the subject route, capacity along the existing two-lane pavement is approximately 8000 vpd. Thus, capacity is exceeded along the entire subject route.

Approximately 220 accidents occurred over a recent 3-year period. This record yielded an accident rate of 366 accidents per 100 million vehicle miles. This is above the statewide average of 283 for similar 2-lane, US routes. The predominant accident types were rear end (34.5%) and angle (14.5%) collisions, and running off the road (15%).

Need for Project

The purpose of this project is to provide additional lanes that would eliminate the present and future capacity deficiencies and improve safety.

III. RECOMMENDATIONS AND COSTS

Widening of US 401 to a multi-lane facility is feasible and warranted immediately. Recommended improvements are as follows:

Segment A

From US 1/US 401 interchange to the Raleigh City limits (0.6 mile south of SR 2041) - 7 lane, 88-foot (12 feet per through lane, with 12-foot center lane for left turns) curb and gutter section, symmetrically widened. Transitioning from 7 to 4 lanes will be required between New Hope Road and the flyover interchange at US 1.

Segment B

From Raleigh City limits to the Northern Wake Expressway - 6 lane, 96-foot (12-foot through lanes with a 16-foot raised median) curb and gutter facility, offset for the most part to the west side of the existing road.

Segment C

From Northern Wake Expressway to SR 2224 (Mitchell Mill Road) north of Neuse River - 4-lane divided (12-foot through lanes with 46-foot median) shoulder section facility, offset to the east side of the existing road. Right-of-way should be obtained for an ultimate 6-lane, divided facility. Transitioning to the existing 2-lane section north of the Neuse River will be required.

A preliminary design alignment for the subject project is on file with the Roadway Design Branch. A critical transition of widening is required at the proposed interchange location for the Northern Wake Expressway. The Apheus (Seth) Jones House and the Rufus J. Ivey House, both of historic significance, occupy the areas immediately northeast and southwest of the respective quadrants of this interchange. Therefore, alignment opportunities around these properties are limited. Cross section transitions at the north and south limits of the project will also have to be addressed.

Bridge number 131 over the Neuse River should be replaced by two new structures in a phased construction to accommodate the proposed roadway cross section. It is not anticipated that a detour structure will be required. No major alterations to the existing horizontal and vertical alignments are anticipated.

Speed limits along the southern segment of the project should be lowered to a consistent 45 mph throughout in accordance with Federal Highway Administration Policy regarding curbed facilities. A consistent 55 mph speed limit beyond the Northern Wake Expressway is anticipated to be retained after completion of the project.

Asymmetrical widening is recommended on this project to minimize disturbance to existing roadside development and corresponding increased right-of-way costs. Existing right-of-way is 100 feet in width from the US 1 interchange to New Hope Road, and 60 feet in width for the remainder of the project. Estimated right-of-way total widths used for cost estimate purposes are 125 feet for Segment A, 150 feet for Segment B, and 250 feet for Segment C.

The total estimated cost of the recommended improvements is \$29,500,000 including \$13,300,000 for roadway construction and \$16,200,000 for right-of-way. Costs for individual segments are as follows:

	<u>Construction Cost</u>	<u>Right-of-Way Cost</u>	<u>Total Cost</u>
Segment A	\$3,100,000	\$5,800,000	\$ 8,900,000
Segment B	4,100,000	3,700,000	7,800,000
Segment C	6,100,000	6,700,000	12,800,000

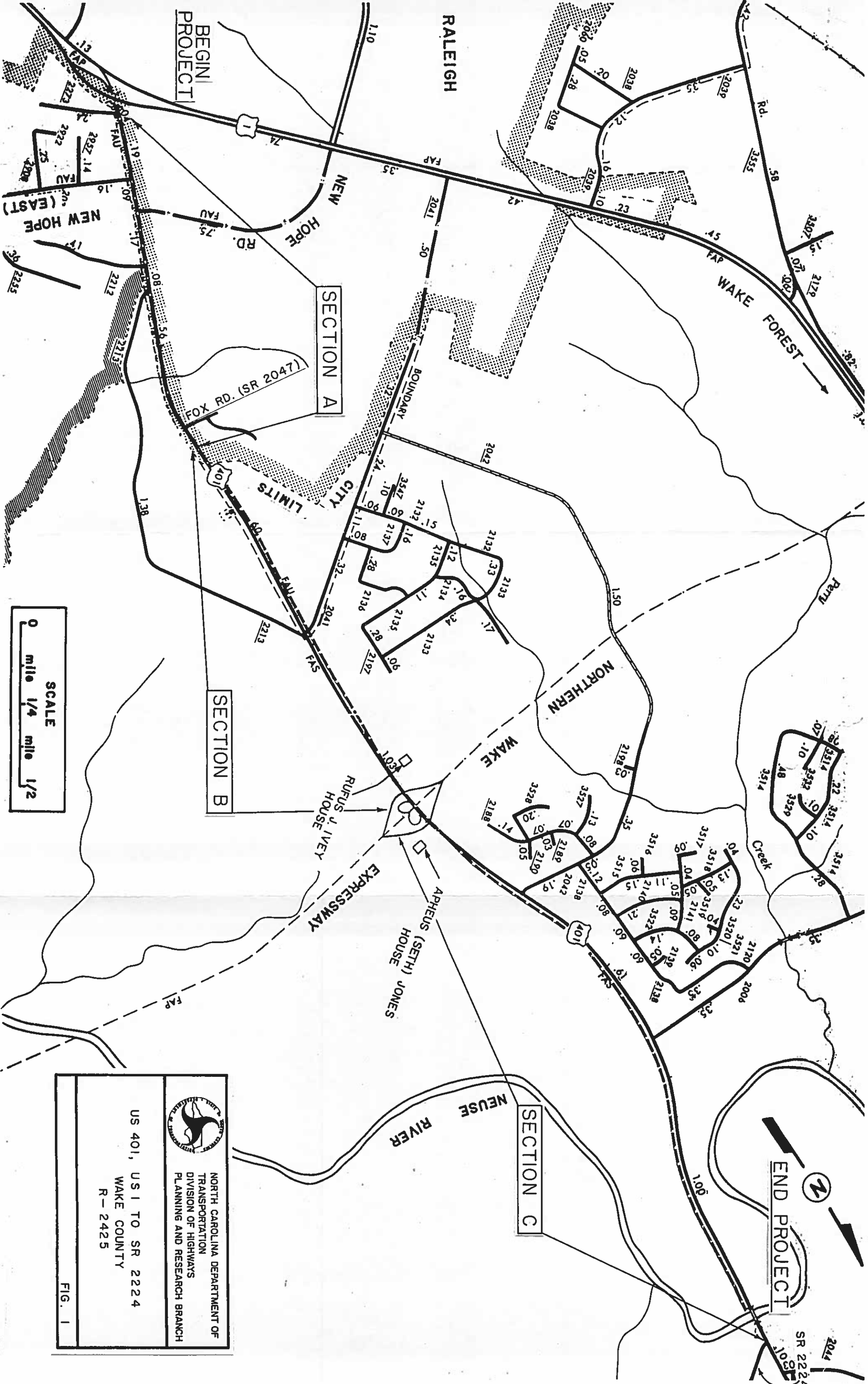
Cost estimates were prepared by the Preliminary Estimate Engineer and the Right-of-Way Branch.


IV. OTHER COMMENTS

Possible negative impacts of this project include: (1) loss of some farmland and woodland; (2) loss of some wetlands at the Neuse River crossing; (3) relocation of 31 residences and 8 businesses; increased noise for the remaining development.

If the project is to be implemented at a future date, all feasible alternatives and their associated impacts will have to be evaluated in a planning and environmental document prior to that time, and a final decision made as to the most appropriate improvement.

MH/rm





NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

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FIG. 1